GOOSE POND
GLENDALE FISH & WILDLIFE AREA
Daviess County
2006 Fish Management Report

Debbie King
Assistant Fisheries Biologist

FISHERIES SECTION
INDIANA DEPARTMENT OF NATURAL RESOURCES
DIVISION OF FISH AND WILDLIFE
I.G.C. South, Room W273
402 W. Washington Street
Indianapolis, Indiana 46204

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EXECUTIVE SUMMARY

- Goose Pond is a 12.6 acre impoundment. The open shoreline is bordered by bulrush and smartweed. Bays on the south shore extend into wooded areas where standing and fallen timber is common. The maximum depth is 20 ft and the average depth is approximately 10 ft. There is a gravel boat ramp and ample shoreline fishing access. Goose Pond is limited to electric motors.

- Seven species of fish were collected. Bluegill ranged from 1.3 to 9.2 in TL. Thirty-six percent of the bluegill were of harvestable size, 6.0 in TL and greater. Redear sunfish ranged from 2.9 to 10.3 in TL. Redear greater than 9.0 in TL accounted for 29% of the redear collected. Size ranges and PSDs for bluegill (45) and redear (79) represent an excellent bluegill/redear fishery. Largemouth bass ranged from 3.2 to 22.9 in TL. However, only two harvestable size bass were collected. Golden shiner, black crappie, yellow, and black bullhead were also collected in small numbers.

- The alkalinity ($\leq$17.1 ppm) and conductivity (20 μS) were low but consistent with previous year's data. The pH, temperature, and DO were normal for the time of day and year.

- Goose Pond has low aquatic macrophyte diversity. Coontail, chara, brittle naiad and creeping water primrose were collected. Common duckweed and filamentous algae was also collected. All species of vegetation collected or noted were native.

FIGURES

Figure Page

INTRODUCTION

Goose Pond is located on Glendale Fish & Wildlife Area on the south side of Dogwood Lake in Daviess County. The impoundment was expanded from its original 2.4 acres to 12.6 acres in 1979. The open shoreline is bordered with bulrush and smartweed. Bays on the southern side extend into wooded areas where standing and fallen timber is common. In addition to largemouth bass and bluegill, channel catfish stockings occurred in 1975, 1979, and 1982. Adult redear sunfish were introduced in 1981.

The maximum depth is 20 ft and the average depth is approximately 10 ft. There is a gravel boat ramp and ample shoreline fishing access. Goose Pond is limited to electric motors.

Goose Pond has had a history of unstable bass/bluegill populations. However, improvements in the predator/prey relationship were documented in the past two surveys (Andrews 1989, 1991). The purpose of the 2006 Goose Pond general survey was to evaluate the overall status of the fishery under the current 14-in largemouth bass minimum size limit management strategy.

METHODS

A standard fish survey was conducted at Goose Pond on May 22 to 24, 2006, according to the Manual of Fisheries Survey Methods (Shipman et al. 2001). Sampling effort consisted of 0.5 h of pulsed DC night electrofishing, two overnight trap net sets, and two overnight gill net sets (Figure 1). Fish were measured to the nearest 0.1 in TL. Scale samples were taken from game species for age and growth analysis. District averages were used to estimate fish weight. Proportional stock density (PSD) was calculated for largemouth bass, bluegill, and redear (Anderson and Neumann 1996). Water chemistry data was collected.

Tier II aquatic vegetation sampling was conducted on July 18, 2006. A GPS unit was used to record the location of the limnological, fish, and aquatic vegetation collection sites.

RESULTS

Water quality data was collected in May during the general survey, with the exception of the temperature and dissolved oxygen (DO) profile which was taken on July 18, 2006. The conductivity was 20 μS. The Secchi disk reading was 4 ft 7 in. The pH was 8.7 at the surface

and 7.5 at the bottom. Alkalinity was ≤17.1 ppm at the surface and bottom. Dissolved oxygen was 10.5 ppm at the surface and 1.3 ppm at the bottom. The DO was adequate for fish survival to a depth of 8 ft.

Three species of submersed vegetation were documented. Coontail had a dominance index (DI) of 10, occurring at 43% of the sample sites (N = 30). Both creeping water primrose and Chara's DI were 30 and the frequency of occurrence was 14 and 3, respectively. Brittle naiad and common duckweed each occurred at 3% of the sample sites. Filamentous algae included Hydrodictyon and Spirogyra. Blue-green algal trichomes were also observed in the water column during the aquatic vegetation survey. American pondweed was noted but not collected in the survey. The open shoreline was bordered with bulrush and smartweed.

A total of 254 fish representing seven species was collected during the survey with an estimated weight of 61.3 lbs. Bluegill dominated the catch by number (74%) followed by largemouth bass and redear sunfish, each representing 10% of the fish collected. Golden shiner, yellow bullhead, black crappie, and black bullhead were also collected in small numbers.

The bluegill sample consisted of 188 fish ranging from 1.3 to 9.2 in TL. Bluegill represented 36% of the total weight of fish collected. The electrofishing catch rate was 352 bluegill/h, compared to 107 bluegill/h in 1990. The PSD was 45. Thirty-six percent of the bluegill collected were of harvestable size, compared to 41% in 1990. Bluegill growth was good.

The largemouth bass sample consisted of 26 fish ranging from 3.2 to 22.9 in TL. Bass represented 42% of the total weight of fish collected. Representative numbers of bass from ages 1 though 5 were collected, indicating consistent recruitment. Only two legal bass were collected, 21.7 and 22.9 in TL. The remaining bass were less than 14 in TL. The electrofishing catch rate was 48 bass/h, down from 61 bass/h in 1990. Bass growth was similar to the previous survey for ages 1, 2, and 3 (Andrews 1991). However, at ages 4 and 5, bass growth was well below previous surveys' estimates.

Twenty-five redear sunfish were collected ranging from 2.9 to 10.3 in TL. The electrofishing catch rate was 36 redear/h. Redear ages 1 through 4, and 6 were represented in the catch. Redear 9.0 in TL and greater accounted for 29% of the fish collected. Good redear growth and low recruitment were consistent with previous surveys (Andrews 1989, 1991).

DISCUSSION

Goose Pond's low water conductivity and dense areas of creeping water primrose likely resulted in low electrofishing catch rates. However, catch rates were still consistent with previous year's data (Andrews 1989, 1991). Size ranges and PSDs represent an excellent bluegill/redear fishery that appears to be stable. The combination of bass predation and angler harvest is maintaining good bluegill and redear growth. Bass numbers are also sufficient to keep golden shiner, crappie, and bullhead, present in the previous survey, in check. Bass from ages 1 though 5 were collected, indicating consistent recruitment. Only two legal bass were collected, 21.7 and 22.9 in TL. The remaining bass were less than 14.0 in TL.

The alkalinity ($\leq$17.1 ppm) and conductivity (20 μS) were low but consistent with the previous year's data. An alkalinity of 20 ppm has been suggested as a minimum for impoundments to buffer against daily fluctuations in pH (Wurts 1992). However, the pH, temperature, and DO were normal for the time of day and year.

Goose Pond has low aquatic macrophyte diversity. However, all species of vegetation collected or noted were native. Although coontail was the dominant species it's DI (10) was relatively low. Deep water and low Secchi disk readings keep coontail under control. Low alkalinity may also play a role in the diversity and densities of aquatic plants at Goose Pond.

The gravel ramp is adequate for boat access and ample shoreline fishing opportunities exist. Under the current management strategy of a 14-in largemouth bass minimum size limit, the Goose Pond fishery appears to be stable, providing excellent bluegill/redear fishing with an occasional nice bass.

LITERATURE CITED

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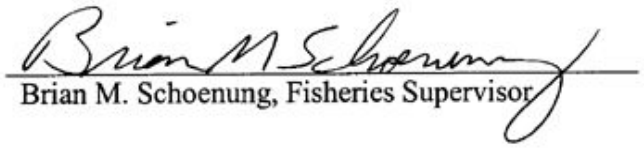
Approved by: David S. Kittaka, Fisheries Biologist

Approved by: 
Brian M. Schoenung, Fisheries Supervisor

Date: November 17, 2007

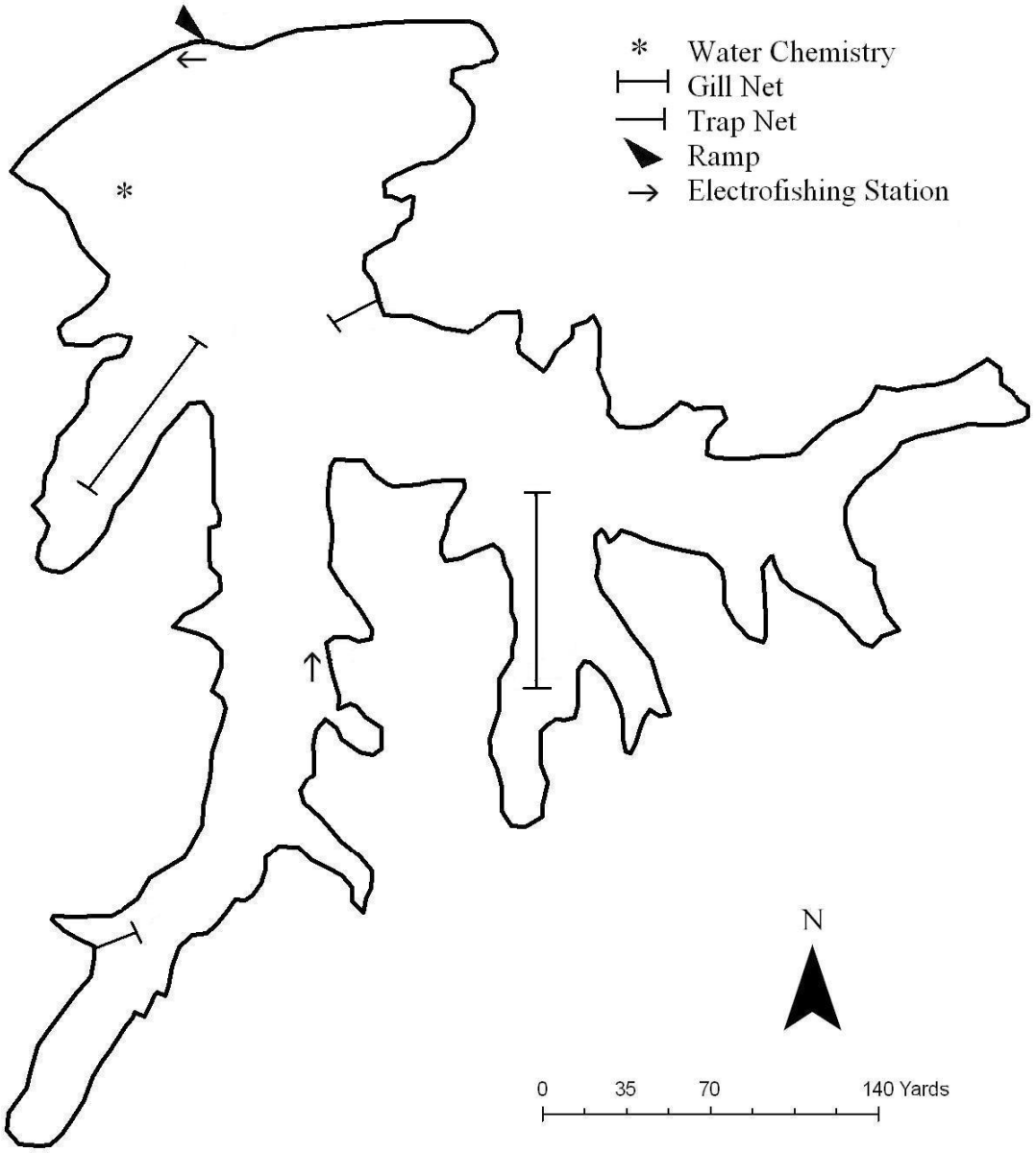


Figure 1. Goose Pond, GFWA, Daviess County. Location of water chemistry, gill net, trap nets, and electrofishing stations, 2006.

LAKE SURVEY REPORT

Type of Survey: [ ] Initial Survey [X] Re-Survey

Lake Name	County	Date of survey (Month, day, year)
Goose Pond	Daviess	5/22/2006 to 5/24/2006
Biologist's name		Date of approval (Month, day, year)
Dave Kittaka, Debra King, Jennifer Pritchett		11/19/2007

LOCATION		
Quadrangle Name	Range	Section
Glendale	1N	6W
Township Name	Nearest Town	
Montgomery	Montgomery	

ACCESSIBILITY					
State owned public access site			Privately owned public access site		Other access site
gravel boat ramp					
Surface acres	Maximum depth	Average depth	Acre feet	Water level	Extreme fluctuations
12.6	20	10			
Location of benchmark					

INLETS		
Name	Location	Origin
runoff		

OUTLETS	
Name	Location
none	
Water level control	

POOL	ELEVATION (Feet MSL)	ACRES
TOP OF DAM		
TOP OF FLOOD CONTROL POOL		
TOP OF CONSERVATION POOL		
TOP OF MINIMUM POOL		
STREAMBED		

Bottom type

- [ ] Boulder
- [ ] Gravel
- [X] Sand
- [X] Muck
- [X] Clay
- [ ] Marl

Watershed use

Development of shoreline

Previous surveys and investigations

General Surveys 1973, 1978, 1987, 1990

Spot check 1981, 1982 , 1988

Fish Kill 1981 (LMB & BLG), RSF stocked in 1981

SAMPLING EFFORT AT GOOSE POND 2006					
ELECTROFISHING	Day hours N/A		Night hours 0.5		Total hours 0.5
TRAP NETS	Number of traps 2		Number of Lifts 1		Total effort 2
GILL NETS	Number of nets 2		Number of Lifts 1		Total effort 2
ROTENONE	Gallons	ppm	Acre Feet Treated	SHORELINE SEINING	Number of 100 Foot Seine Hauls

PHYSICAL AND CHEMICAL CHARACTERISTICS	
Color Brown	Turbidity 4 Feet 7 Inches (SECCHI DISK)
Alkalinity (ppm)* Surface: ≤17 .1 Bottom: ≤17 .1	pH Surface: 8.7 Bottom: 7.5
Conductivity: 20 µS	Air temperature: °F
Water chemistry GPS coordinates: N 38.530565	W -87.034126

TDS 0.01

TEMPERATURE AND DISSOLVED OXYGEN (D.O.)								
DEPTH (FEET)	Degrees (°F)	D.O. (ppm)	DEPTH (FEET)	DEGREES (°F)	D.O. (ppm)	DEPTH (FEET)	DEGREES (°F)	D.O. (ppm)
SURFACE	86.5	10.50	36			72		
2	86.0	10.14	38			74		
4	84.9	8.45	40			76		
6	79.5	11.76	42			78		
8	73.8	10.00	44			80		
10	62.4	1.93	46			82		
12	55.8	1.58	48			84		
14	50.7	1.52	50			86		
16	48.6	1.42	52			88		
18	47.3	1.33	54			90		
20 btm	47.1	1.28	56			92		
22			58			94		
24			60			96		
26			62			98		
28			64			100		
30			66					
32			68					
34			70					

COMMENTS
5/24 - Having trouble with DO meter. 5/25 Outboard failure. DO /Temp profile above taken 7/18/2006 with Air Temp 90°F.

*ppm-parts per million

SPECIES AND RELATIVE ABUNDANCE OF FISHES COLLECTED BY NUMBER AND WEIGHT AT GOOSE POND 2006					
*COMMON NAME OF FISH	NUMBER	PERCENT	LENGTH RANGE (inches)	WEIGHT (pounds)	PERCENT
Bluegill	188	74.0	1.3 - 9.2	22.32	36.4
Largemouth bass	26	10.2	3.2 - 22.9	25.83	42.1
Redear sunfish	25	9.8	2.9 - 10.3	8.99	14.7
Golden shiner	9	3.5	7.1 - 8.6	1.91	3.1
Yellow bullhead	3	1.2	9.5 - 9.9	1.21	2.0
Black crappie	2	0.8	8.6	0.62	1.0
Black bullhead	1	0.4	8.8	0.42	0.7
TOTAL	254			61.30	

*Common names of fishes recognized by the American Fisheries Society.

NUMBER, PERCENTAGE, WEIGHT, AND AGE OF BLUEGILL AT GOOSE POND 2006									
TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH	TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH
1.0	2	1.1	**	1	19.0				
1.5	19	10.1	**	1	19.5				
2.0	17	9.0	**	1	20.0				
2.5	10	5.3	0.01	1	20.5				
3.0	21	11.2	0.02	2	21.0				
3.5	12	6.4	0.03	2	21.5				
4.0	6	3.2	0.04	2,3	22.0				
4.5	14	7.4	0.06	2,3,4	22.5				
5.0	10	5.3	0.08	3	23.0				
5.5	12	6.4	0.11	3,4	23.5				
6.0	14	7.4	0.15	3,4,5	24.0				
6.5	11	5.9	0.19	4,5,6	24.5				
7.0	13	6.9	0.24	4,5	25.0				
7.5	19	10.1	0.30	4,5,6	25.5				
8.0	5	2.7	0.37	6,7	26.0				
8.5	2	1.1	0.45	6	TOTAL	188	100.0		
9.0	1	0.5	0.54	7					
9.5									
10.0									
10.5									
11.0									
11.5									
12.0									
12.5									
13.0									
13.5									
14.0									
14.5									
15.0									
15.5									
16.0									
16.5									
17.0									
17.5									
18.0									
18.5									

ELECTROFISHING CATCH	352.0 /hr	GILL NET CATCH	2.0 /lift	TRAP NET CATCH	5.0 /lift

* Average weights derived from district averages

** Less than 0.01 pound.

NUMBER, PERCENTAGE, WEIGHT, AND AGE OF LARGEMOUTH BASS AT GOOSE POND 2006									
TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH	TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH
1.0					19.0				
1.5					19.5				
2.0					20.0				
2.5					20.5				
3.0	1	3.8	0.01	1	21.0				
3.5					21.5	1	3.8	5.55	
4.0	1	3.8	0.04	1	22.0				
4.5					22.5	1	3.8	6.56	
5.0					23.0				
5.5					23.5				
6.0					24.0				
6.5	2	7.7	0.12	2	24.5				
7.0	2	7.7	0.15	2	25.0				
7.5	1	3.8	0.18	2	25.5				
8.0	2	7.7	0.22	2	26.0				
8.5					TOTAL	26	100.0		
9.0									
9.5									
10.0									
10.5	1	3.8	0.51	3					
11.0	1	3.8	0.58	4					
11.5	4	15.4	0.67	3,4					
12.0	4	15.4	0.77	3,4					
12.5	3	11.5	0.88	4,5,6					
13.0	2	7.7	1.02	5,6					
13.5									
14.0									
14.5									
15.0									
15.5									
16.0									
16.5									
17.0									
17.5									
18.0									
18.5									

ELECTROFISHING CATCH	48.0 /hr	GILL NET CATCH	1.0 /lift	TRAP NET CATCH	0.0 /lift

* Average weights derived from district averages

** Less than 0.01 pound.

NUMBER, PERCENTAGE, WEIGHT, AND AGE OF REDEAR SUNFISH AT GOOSE POND 2006									
TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH	TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH
1.0					19.0				
1.5					19.5				
2.0					20.0				
2.5	1	4.0	0.01	2	20.5				
3.0	2	8.0	0.02	1	21.0				
3.5	1	4.0	0.03	1	21.5				
4.0					22.0				
4.5	1	4.0	0.06	2	22.5				
5.0					23.0				
5.5					23.5				
6.0					24.0				
6.5	2	8.0	0.19	2,3	24.5				
7.0	3	12.0	0.23	2,3	25.0				
7.5					25.5				
8.0	5	20.0	0.36	3,4	26.0				
8.5	4	16.0	0.43	3,4	TOTAL	25	100.0		
9.0	4	16.0	0.51	4					
9.5	1	4.0	0.60	4					
10.0	1	4.0	0.70	6					
10.5									
11.0									
11.5									
12.0									
12.5									
13.0									
13.5									
14.0									
14.5									
15.0									
15.5									
16.0									
16.5									
17.0									
17.5									
18.0									
18.5									

ELECTROFISHING CATCH	36.0 /hr	GILL NET CATCH	0.0 /lift	TRAP NET CATCH	4.0 /lift

* Average weights derived from district averages

** Less than 0.01 pound.

Lake: Goose Pond
Date: 5/22/2006 to 5/24/2006
Species: Bluegill

Length group (in)	Total Number	Sub-Sample	Age								
			1	2	3	4	5	6	7	8	9
1.0	2	1	2								
1.5	19	12	19								
2.0	17	9	17								
2.5	10	3	10								
3.0	21	14		21							
3.5	12	10		12							
4.0	6	5		1	5						
4.5	14	12		1	11	2					
5.0	10	8			10						
5.5	12	9			9	3					
6.0	14	11			3	9	3				
6.5	11	11				4	6	1			
7.0	13	9				3	10				
7.5	19	13				3	4	12			
8.0	5	4						4	1		
8.5	2	2						2			
9.0	1	1							1		
9.5											
Total	188	134	48	35	38	24	23	19	2		

Age	Number	Mean TL	Var	SE	Lo 95%CI	Up 95%CI
1	46	2.2	0.15	0.06	2.0	2.3
2	35	3.5	0.13	0.06	3.4	3.6
3	37	5.2	0.33	0.09	5.0	5.4
4	24	6.4	0.68	0.17	6.1	6.8
5	23	7.1	0.21	0.10	6.9	7.3
6	18	7.9	0.20	0.10	7.7	8.1
7	2	8.7	0.44	0.44	7.8	9.6

Lake: Goose Pond
Date: 5/22/2006 to 5/24/2006
Species: Largemouth bass

Length group (in)	Total Number	Sub-sample	Age 1	2	3	4	5	6	7	8	9
1.0											
1.5											
2.0											
2.5											
3.0	1	1	1								
3.5											
4.0	1	1	1								
4.5											
5.0											
5.5											
6.0											
6.5	2	2		2							
7.0	2	2		2							
7.5	1	1		1							
8.0	2	2		2							
8.5											
9.0											
9.5											
10.0											
10.5	1	1			1						
11.0	1	1				1					
11.5	4	4			1	3					
12.0	4	4			3	1					
12.5	3	3				1	1	1			
13.0	2	2					1	1			
13.5											
~	~	~	~	~	~	~	~	~	~	~	~
21.0											
21.5	1	1								1	
22.0											
22.5	1	1									1
23.0											
Total	26	26	2	7	5	6	2	2	0	1	1

Age	Number	Mean TL	Var	SE	Lo 95%CI
1	2	3.8	0.50	0.50	2.8
2	7	7.5	0.40	0.24	7.0
3	8	11.8	0.29	0.19	11.4
4	3	12.3	0.25	0.29	11.7
5	3	12.9	0.08	0.17	12.6
6	1	13.3	N/A	N/A	N/A
7					
8	1	21.8	N/A	N/A	N/A
9	1	22.8	N/A	N/A	N/A

Lake: Goose Pond
Date: 5/22/2006 to 5/24/2006
Species: Redear sunfish

Length group (in)	Total Number	Sub-Sample	Age 1	2	3	4	5	6	7	8	9
1.0											
1.5											
2.0											
2.5	1	1		1							
3.0	2	2	2								
3.5	1	1	1								
4.0											
4.5	1	1		1							
5.0											
5.5											
6.0											
6.5	2	2		1	1						
7.0	3	3		1	2						
7.5											
8.0	5	5			4	1					
8.5	4	4			1	3					
9.0	4	4				4					
9.5	1	1				1					
10.0	1	1						1			
Total	25	25	3	4	8	9		1			

Age	Number	Mean TL	Var	SE	Lo 95%CI	9
1	3	3.4	0.08	0.17	3.1	
2	4	5.4	4.23	1.03	3.3	
3	8	7.9	0.48	0.25	7.4	
4	9	9.0	0.19	0.15	8.7	
5						
6	1	10.3	N\A	N\A	N\A	

Occurrence and Abundance of Submersed Aquatic Plants - Overall

Lake:	Goose Pond	**Secchi (ft):**	5.2	**SE Mean Species / Site:**	0.18
Date:	7/18/2006	**Littoral Sites w/Plants:**	20	**Mean Natives / Site:**	1.10
Littoral Depth (ft):	6.0	**Number of Species:**	5	**SE Mean Natives / Site:**	0.18
Littoral Sites:	30	**Max. Species / Site:**	3	**Species Diversity:**	0.69
Total Sites:	30	**Mean Species / Site:**	1.10	**Native Diversity:**	0.69

	Frequency of	Score Frequency				
Species	**Occurrence**	**0**	**1**	**3**	**5**	**Dominance**
Coontail	43.3	56.7	40.0	3.3	0.0	10.0
Creeping water primrose	30	70.0	20.0	0.0	10.0	14.0
Chara	30	70.0	26.7	3.3	0.0	7.3
Brittle naiad	3.3	96.7	3.3	0.0	0.0	0.7
Common duckweed	3.3	96.7	3.3	0.0	0.0	0.7
Filamentous algae	20.0					

Other species noted: American pondweed

GPS LOCATIONS OF SAMPLING EQUIPMENT AT GOOSE POND 2006												
GILL NETS					TRAP NETS					ELECTROFISHING				
1	N	38.529499	W	-87.032341	1	N	38.53011	W	-87.033084	1	N	38.53106	W	-87.033754
	N	38.528895	W	-87.032316	2	N	38.52801	W	-87.034139		N		W	
2	N	38.530009	W	-87.033807	3	N		W		2	N		W	
	N	38.529558	W	-87.034288	4	N		W			N		W	
3	N		W		5	N		W		3	N		W	
	N		W		6	N		W			N		W	
4	N		W		7	N		W		4	N		W	
	N		W		8	N		W			N		W	
5	N		W		9	N		W		5	N		W	
	N		W		10	N		W			N		W	
6	N		W		11	N		W		6	N		W	
	N		W		12	N		W			N		W	
7	N		W		13	N		W		7	N		W	
	N		W		14	N		W			N		W	
8	N		W		15	N		W		8	N		W	
	N		W		16	N		W			N		W	
9	N		W		17	N		W		9	N		W	
	N		W		18	N		W			N		W	
10	N		W		19	N		W		10	N		W	
	N		W		20	N		W			N		W	
11	N		W							11	N		W	
	N		W								N		W	
12	N		W							12	N		W	
	N		W								N		W	
13	N		W							13	N		W	
	N		W								N		W	
14	N		W							14	N		W	
	N		W								N		W	
15	N		W							15	N		W	
	N		W								N		W	
16	N		W							16	N		W	
	N		W								N		W	
17	N		W							17	N		W	
	N		W								N		W	
18	N		W							18	N		W	
	N		W								N		W	
19	N		W							19	N		W	
	N		W								N		W	
20	N		W							20	N		W	
	N		W								N		W	